REMARKS

The Examiner is thanked for the due consideration given the application. A terminal disclaimer is being filed concurrently with this paper. Claims 1-11 and 13-20 remain in this application. No new matter is believed to be added to the application by this response.

Statement of Substance of Interview

The Examiner is thanked for graciously conducting a personal interview with the applicant's representative on April 14, 2011. During the interview it was noted that the present invention is covalently bonded while the compound of ARMAND is a salt, and that the compound of ARMAND is perfluorinated or perhalogenated while the present invention is not.

At the end of the interview the Examiner prepared an interview summary. The interview summary has been reviewed, and it appears to accurately reflect the substance of the interview.

Art Rejections

Claims 1-9, 15-18 and 20 stand rejected under 35 USC §103(a) as being unpatentable over YAMAGUCHI et al. (U.S. Publication 2002/0037458) in view of ARMAND (U.S. Patent 4,818,644).

Claims 10 and 11 stand rejected under 35 USC §103(a) as being unpatentable over YAMAGUCHI et al. in view of ARMAND, and further in view of FLEISCHER et al. (U.S. Patent 6,225,009).

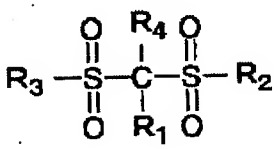
Claims 13 and 14 stand rejected under 35 USC §103(a) as being unpatentable over YAMAGUCHI et al. in view of ARMAND, and further in view of UTSUGI et al. (U.S. Publication 2004/0043300).

Claim 19 stands rejected under 35 USC §103(a) as being unpatentable over YAMAGUCHI et al. in view of ARMAND, and further in view of SHIOTA (U.S. Patent 5,795,674).

These rejections remain respectfully traversed.

The present invention pertains to a secondary battery that includes an electrolyte solution that contains a compound represented by the general formula (1):

[Formula 1]



(1)

Formula (1) ***is not perfluorinated or perhalogenated.*** Moreover, formula (1) of the present invention ***is covalently bonded.*** These two features clearly distinguish the present invention over the applied art, particularly over ARMAND.

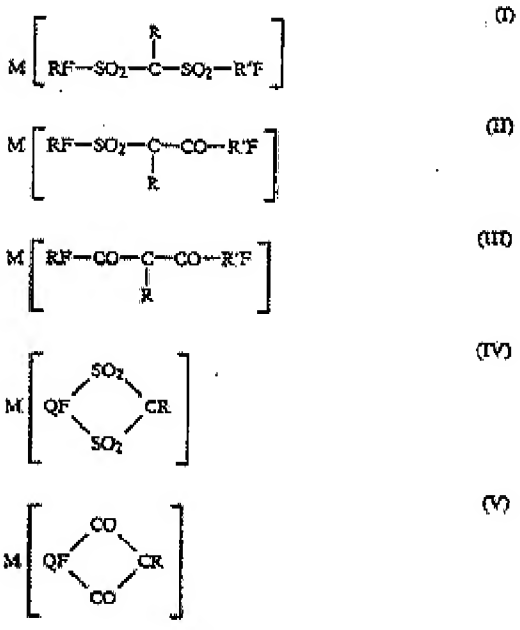
That is, the covalent compound of general formula (1) is not perfluorinated or perhalogenated and has two sulfonyl groups, has small LUMO, and is easily reduced because the value of LUMO is smaller than those of a solvent composed of a cyclic carbonate or a chain carbonate and a monosulfonate in the electrolyte solution. Therefore, a reduction film of the compound of general formula (1) is formed on the negative electrode prior

to a solvent composed of a cyclic carbonate or a chain carbonate, and plays a role of inhibiting decomposition of solvent molecules.

Distinctions of the present invention over the applied art have been made of record in the application which, for brevity, are not repeated here.

But consider again ARMAND.

Claim 1 of ARMAND recites: "Ionically conductive material composed of ***a salt*** in solution in a solvent, characterized by the fact that ***the salt is represented by one of the following formulas***:



in which:

M is an alkali metal, alkaline earth metal, transition metal, or rare earth metal,

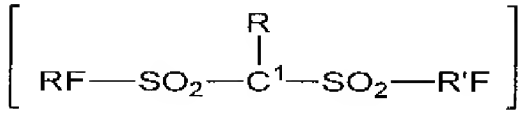
RF and R'F, which are identical or different, each represents ***a perhalogenated, preferably perfluorinated group having from 1 to 12 carbon atoms***,

R is hydrogen or an alkyl group having from 1 to 30 carbon atoms,

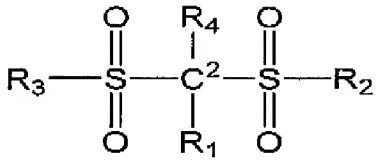
QF is a divalent perfluorinated group having from 2 to 6 carbon atoms."

The Office Action asserts that compound (I) of ARMAND is notably the same chain disulfonate as recited in the claimed general formula (1).

However, as described in claim 1, the compound (I) of ARMAND is the ***salt***. Since M is an alkali metal, alkaline earth metal, transition metal, or rare earth metal, M becomes a ***cation*** in the compound (I). Since carbon atom C^1 of the following partial structure is bonded to only ***three groups*** (SO_2RF, SO_2RF' and R), the partial structure becomes ***anionic*** in the compound (I).



In contrast, carbon atom C^2 of the claimed general formula (1) of the present invention is bonded to four groups (SO_2R_3, SO_2R_4, R_1 and R_4), and the claimed general formula (1) is ***neutral***, i.e., covalent. The claimed general formula (1) of the present invention is different from the chemical compound (I) of ARMAND.



(1)

As described in claim 1, RF and R'F of the compound (I) of ARMAND represents a perhalogenated, preferably perfluorinated group having from 1 to 12 carbon atoms. However, ARMAND does not disclose a group of the type RF and R'F. Since $(CF_3SO_2)_2CHLi$ is disclosed in Example 1 of ARMAND, the Office may possibly interpret RF and R'F as a perhalogenated, preferably perfluorinated ***alkyl*** group. However, RF and R'F are different from R_2 and R_3 of the claimed general formula (1).

That is, if RF and R'F are a ***per***halogenated or ***per***fluorinated alkyl group, all hydrogen atoms bonded to the carbon atom in the alkyl group are substituted by halogen or fluorine. In contrast, R_2 and R_3 of the claimed general formula (1) of the present invention represents a fluoroalkyl group optionally. As described in paragraph [0044] of US2007/0154815 (the publication of the present application), the hydrogen atoms bonded to the carbon atom in this fluoroalkyl group are ***partly*** substituted by fluorine, and the polyfluoroalkyl group (perfluorinated alkyl group) has already been removed from the options of R_2 and R_3 in the prosecution history.

Therefore, the f1uoroalkyl group of the claimed general formula (1) of the present invention is different from RF and R'F of the compound (I) of ARMAND.

One of ordinary skill and creativity would thus not produce a claimed embodiment of the present invention from a knowledge of the applied art. A *prima facie* case of unpatentability has thus not been made.

These rejections are believed to be overcome, and withdrawal thereof is respectfully requested.

Double Patenting Rejections

Claims 1-9, 15-18 and 20 have been provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 13 of co-pending Application No. 10/541,063 in view of YAMAGUCHI et al.

Claims 10 and 11 have been provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 13 of co-pending Application No. 10/541,063 in view of YAMAGUCHI et al. and FLEISCHER et al.

Claims 13 and 14 have been provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 13 of co-pending Application No. 10/541,063 in view of YAMAGUCHI et al. and UTSUGI et al.

Claim 19 has been provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being

unpatentable over claim 13 of co-pending Application No. 10/541,063 in view of YAMAGUCHI et al. and SHIOTA.

A terminal disclaimer of co-pending Application No. 10/541,063 is being concurrently filed.

Withdrawal of these double patenting rejections is accordingly respectfully requested.

Conclusion

The Examiner is thanked for considering the Information Disclosure Statements filed May 13, 2009, March 21, 2007 and June 14, 2006 and for making the references therein of record in the application.

Prior art of record but not utilized is believed to be non-pertinent to the instant claims.

As no issues remain, the issuance of a Notice of Allowability is respectfully solicited.

Should there be any matters that need to be resolved in the present application, the Examiner is respectfully requested to contact the undersigned at the telephone number listed below.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any

overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

YOUNG & THOMPSON

/Robert E. Goozner/

Robert E. Goozner, Reg. No. 42,593
209, Madison Street, Suite 500
Alexandria, VA 22314
Telephone (703) 521-2297
Telefax (703) 685-0573
(703) 979-4709

REG/lrs

APPENDIX:

- Terminal Disclaimer